OSMEOA results in changes in the dimensions of the glenoid. This study aimed to assess the size and radius of curvature of arthritic glenoids. A total of 145 CT scans were analysed, performed as part of routine pre-operative assessment before total shoulder replacement in 91 women and 54 men. Only patients with primary osteoarthritis and a concentric glenoid were included in the study. The CT scans underwent three-dimensional (3D) reconstruction and were analysed using dedicated computer software. The measurements consisted of maximum superoinferior height, anteroposterior width and a best-fit sphere radius of curvature of the glenoid.

The mean height was 40.2 mm (SD 4.9), the mean width was 29 mm (SD 4.3) and the mean radius of curvature was 35.4 mm (SD 7.8). The measurements were statistically different in men and women and had a Gaussian distribution with marked variation. All measurements were greater than the known values in normal subjects.

With current shoulder replacement systems using a unique backside radius of curvature for the glenoid component, there is a risk of undertaking excessive reaming to adapt the bone to the component resulting in sacrifice of subchondral bone or underreaming and instability of the component due to a ‘rocking horse’ phenomenon.

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Materials and Methods
The study cohort comprised the computerised tomography (CT) scans of patients with primary osteoarthritis who underwent TSR between 2005 and 2010 in four surgical centres: three from France (Lyon, Nice and Rennes) and one from the United States (Houston).

A total of 173 scans were excluded because of a poor quality or incompleteness, previous surgery, post-traumatic arthritis, arthropathy secondary to instability, inflammatory disease or osteonecrosis. A further 52 scans were excluded because they revealed biconcave or dysplastic glenoids. This left 145 scans (116 CT arthrograms and 29 CT scans) from shoulders with primary osteoarthritis and a concentric glenoid. There were 94 women and 51 men with a mean age of 67 years (45 to 82). The left shoulder was involved in 68 scans (46.9%) and the right shoulder in 77 (53.1%). According to the classification of Walch et al, the glenoid was a type A1 (concentric with minor central erosion) in 60 shoulders, A2 (concentric with major central erosion) in 44, and B1 (concentric with posterior subluxation of the humerus head without bony erosion) in 41.

Each of the 145 scans underwent three-dimensional (3D) reconstruction using Digital...